P-216 - SURVIVAL AND ACTIVITY OF BRETTANOMYCES/DEKKERA IN MONOVARIETAL WINES

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Background

Volatile phenols in wines are responsible for unpleasant aromas (horse sweat, leather, clove, barnyard), which affect the wine quality. These compounds are produced from the degradation of hydroxycinnamic acids mainly by the yeasts *Brettanomyces/Dekkea* (Kheir et al., 2013). The aim of this work was to evaluate the survival and activity of *Brettanomyces/Dekkera* in monovarietal wines and to estimate the influence of the grape variety.

Method

Fifteen wines, five of each of the grape varieties Touriga Nacional (TN), Cabernet Sauvignon (CS) and Syrah (S), were inoculated with one strain of *Brettanomyces/Dekkera* previously selected from a group of 18 wine isolated strains. The pH and ethanol concentration of all wines were adjusted to 3.6 and 13% v/v before inoculation. Yeast growth and survival were monitored by viable counting in solid media and by flow cytometry (BD Accuri™ C6) using the fluorescent dyes propidium iodide and Syto™ 9 for discrimination of live and dead cells. The volatile phenols were analyzed by GC-FID.

Results & Conclusions

Yeast populations of 10^7 CFU/mL were dramatically reduced to undetectable numbers (<3000 CFU/mL) in 24h in all wines as revealed by the plate count method. Plate viable counts of 10^4-10^6 CFU/mL were, however, detected after 48h in 4 TN and 3 CS wines. Cell densities of almost 10^7 CFU/mL were reached in the subsequent sampling times until the end of the experiment (432h). CFU counts were generally lower in the Syrah wines, with only two wines showing plate counts of around 10^6 CFU/mL from 96 and 144h onwards. Viability measurement by flow cytometry showed the presence of viable cells at levels of 10^6 cells/mL in populations not detected by the plate count method, suggesting that a significant part of the populations is in a viable-but-not-culturable state (VBNC). Yeasts were able to attain the culturable state in most of the wines but the time required for the recovery was highly dependent on the wine, being longer in the Syrah wines. The metabolic activity (production of volatile phenols) of VNBC cells seemed to be lower than culturable cells, especially in Syrah wines. The VBNC physiological state has been described in wine yeast populations in response to stress factors such as ethanol and SO_2 (Du Toit et al., 2005).

References & Acknowledgments

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